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REV. 8/63

PROGRESS REPORT

ENGINEERING DEPARTMENT

ORGANIC CHEMICALS DIVISION

JOB NUMBER
EA 4-455

REPORT NUMBER
4

DATE
May 4, 1964

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** To Receive Details Section*

TITLE: Long Range Sewer Plan - WGK Plant
Part IV - Proposed new trunk sewers for WGK Plant

PERSONNEL: J.W.Caskey, C.N.Stutz (R. E. Howard)

PROBLEM: To determine where new trunk sewers are required to serve the present plant and future expansion needs.

SUMMARY: Proposed trunk sewers are shown on page 6.

Progress Report to Determine where new trunk sewers are required.....5-4-64

CER 113140

Background

The Monsanto owned property in Monsanto, Illinois has been divided into drainage areas for study of the long range sewer needs. These areas are shown on the map, page 6. Drainage areas #1, 5, 6, & 7 are not now served by plant sewers.

Unit hydraulic loadings were developed in Report # 3, EA # 4-455 for use in analysis of present and future trunk sewers. The object of this report is to indicate where new trunk sewers are needed and the size required.

Basis of Calculations

Hydraulics in the Village sewer system are based on the same sewer conditions used in Report # 5, EA # 4-276. The flow distribution to the sewers along Monsanto Avenue and in the south WGK plant has been adjusted to reflect the proposed trunk sewer additions. The flow from the Mississippi Ave. system has not been changed. The hydraulic grade line (HGL) elevations of 394.0 at the pump station, 407.0 at manhole (MH) # 9, and 402.8 at Dead Creek are consistent with those in Report # 1, EA # 4-455.

Pond requirements are based on ponding the runoff from a five year frequency storm yielding a CI factor of 0.5 CFS per acre for three hours. This runoff causes the maximum depth expected from a five year storm, which corresponds to the maximum depths given in Report # 5, EA # 4-276 and Report # 1, EA # 4-455.

Sewers were sized so that the HGL at the upper end of the sewer would be within one to two feet of the ground surface during the design storm. The grades shown on proposed sewers are generally minimum grades, and provide velocities of between two and three feet per second when the sewer is flowing full.

Village Sewer System

The flows on page 7 were used to develop the future HGL's shown on pages 8 and 9. A present HGL from Report # 5, EA # 4-276 is shown for comparison.

At a water surface elevation of 407.0, the 19th St. pond in the future will require storage capacity up to 9.7 acre feet, based on 47 acres from area # 1 and 16.3 CFS (7300 gpm) from Socony. The present two acre pond, with four foot depth below elevation 407.0 can store the runoff from about 32 acres of area # 1, plus 16.3 CFS from Socony, when clean.

The future HGL along Monsanto Ave. is shown higher than the present HGL. This is primarily due to the new flow from area # 1. The future HGL in the south WGK area is higher than the present HGL shown. This is due to redistribution of flows and an overflow connection from MH # 26 to Dead Creek instead of from MH # 24.

The 402.8 water surface elevation shown in Dead Creek represents 24 acre feet of storage. This is equivalent to the drainage from 192 acres. The present runoff to Dead Creek is equivalent to the drainage from 120 acres.

Development of the entire south WGK plant by building the proposed sewers would cause a tributary area of about 143 acres plus 6 CFS from the Village residential area, which requires 19.2 acre feet of storage. This would cause a depth of 3.2 feet in the present pond and result in a water surface elevation of 402.0. Therefore, if the proposed overflow were built to Dead Creek, the HGL at MH # 26 would be lower than either profile shows, until additional area along Dead Creek is developed and the storm runoff directed to the creek.

The profiles and flow sheet for the Village sewers do not consider any flow from area # 6. As the area is developed, it will eventually become necessary to add sewer capacity from MH # 2 to the pump station.

Addition of the two 36" sewers shown on the map would allow about 76 CFS of water to enter the system at MH # 2 without raising the HGL at MH # 2 above 396.0. This is considered adequate.

Area # 1

The sewers shown in profile on pages 10 through 12 are sized to carry 2.0 CFS per acre. Dry weather flow will flow to MH # 8A on the Village system. During time of storm, the sewer system will relieve to the 19th St. pond. Future ground elevation in this area should slope from 411 on the west to 410 adjacent to 19th St.

98.64 WGK 97.64 W.G.K

Area # 2

A profile of the proposed rectangular, storm water trench system is shown on page 13. The system is designed to carry 1.5 CFS per acre and discharge to a seepage pond in the north end of the area.

Eventually, a sewer will be required to carry the storm runoff from this area to the East Side Levee and Sanitary District sewer located north of the Illinois Central tracks. Industrial wastes will continue to go to the Village sewer system along Monsanto Avenue.

Area # 3

East of Falling Springs Road

Some of the existing sewers in the east portion of area # 3 will not carry the expected flows of 2.5 CFS per acre. Additional capacity is required along Third St. and "C" St. to maintain a favorable HGL elevation in the eastern portions of building Block # 1, # 2, # 3, and # 4. The present 36" sewer is adequate to serve the area if the proposed sewers shown in profile on page 14 are added. As discussed earlier, a more favorable HGL may be obtained by providing overflow capacity from MH # 26 to Dead Creek.

West of Falling Springs Road

The existing sewers in the west portion of area # 3 are inadequate to handle expected flows. Additional capacity is required to carry the flow from the northern portions of the area. The sewers shown in profile on page 15 were designed to carry 1.22 CFS per acre from building blocks # 7, # 11, and # 13 and 2.5 CFS per acre from the remaining area. The proposed sewer is sized large enough so that the 24" and 18" sewers through Block # 8, which are located under buildings, may be abandoned should this become necessary.

Area # 4

The present trunk sewers serving this area are adequate for anticipated present and future flows.

Area # 5

The proposed trunk sewers shown in profile on page 16 are based on flows of 2.5 CFS per acre. The 24" sewer between 2nd and 3rd streets is based on minimum future ground elevations of 408.0 in building blocks # 21, # 22, and # 25.

Area # 6

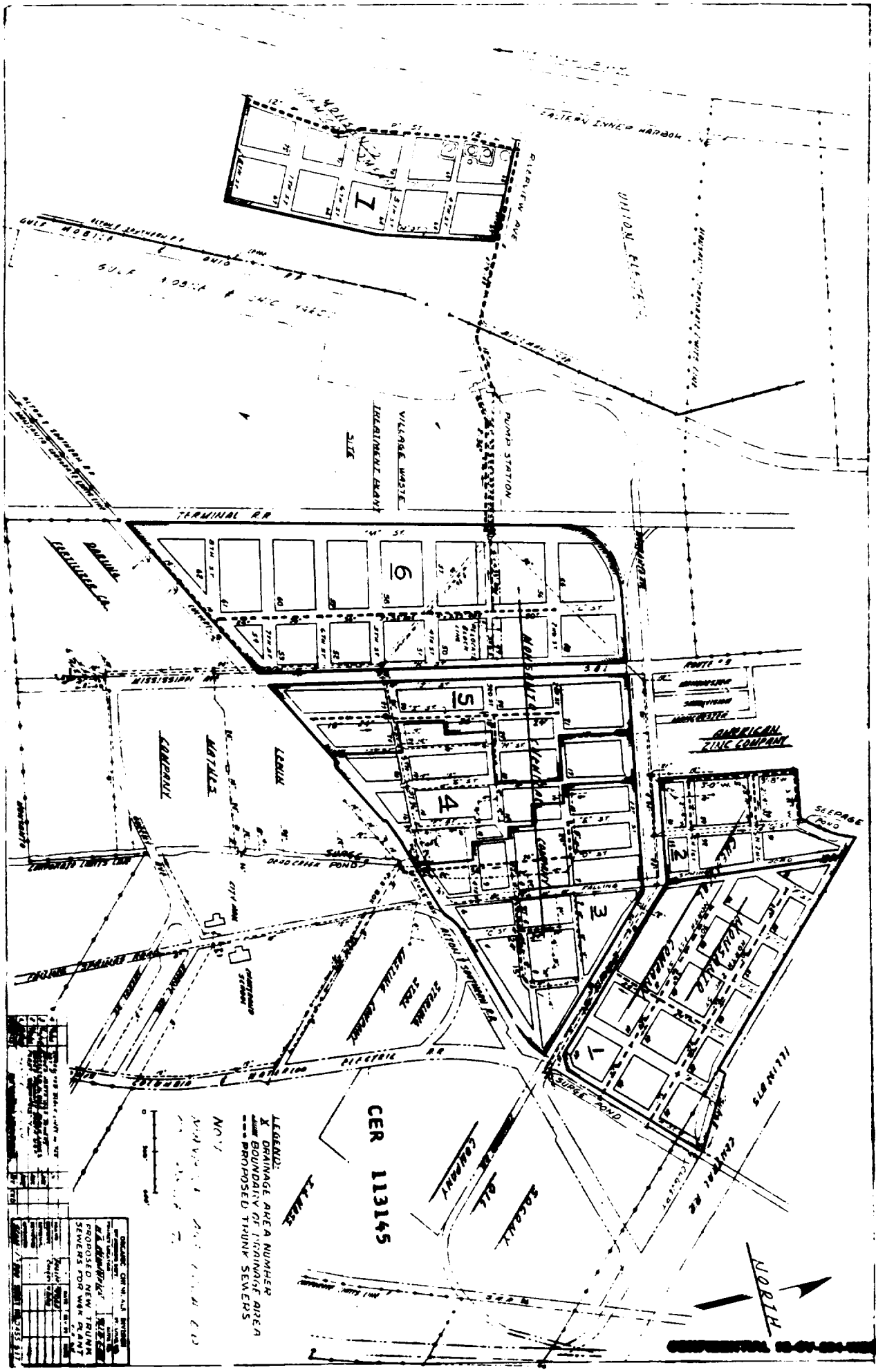
Proposed trunk sewers for area # 6, shown in profile on pages 17 and 18, are based on 2.0 CFS/acre. The initial box sections are placed low enough to intercept the present Village sewers, should it ever be desirable to remove the present Village sewers from service in order to utilize the land to better advantage. It should be noted that as area # 6 is developed, it will eventually become necessary to provide additional capacity between MH # 2 and the pump station to maintain present HGL elevations.

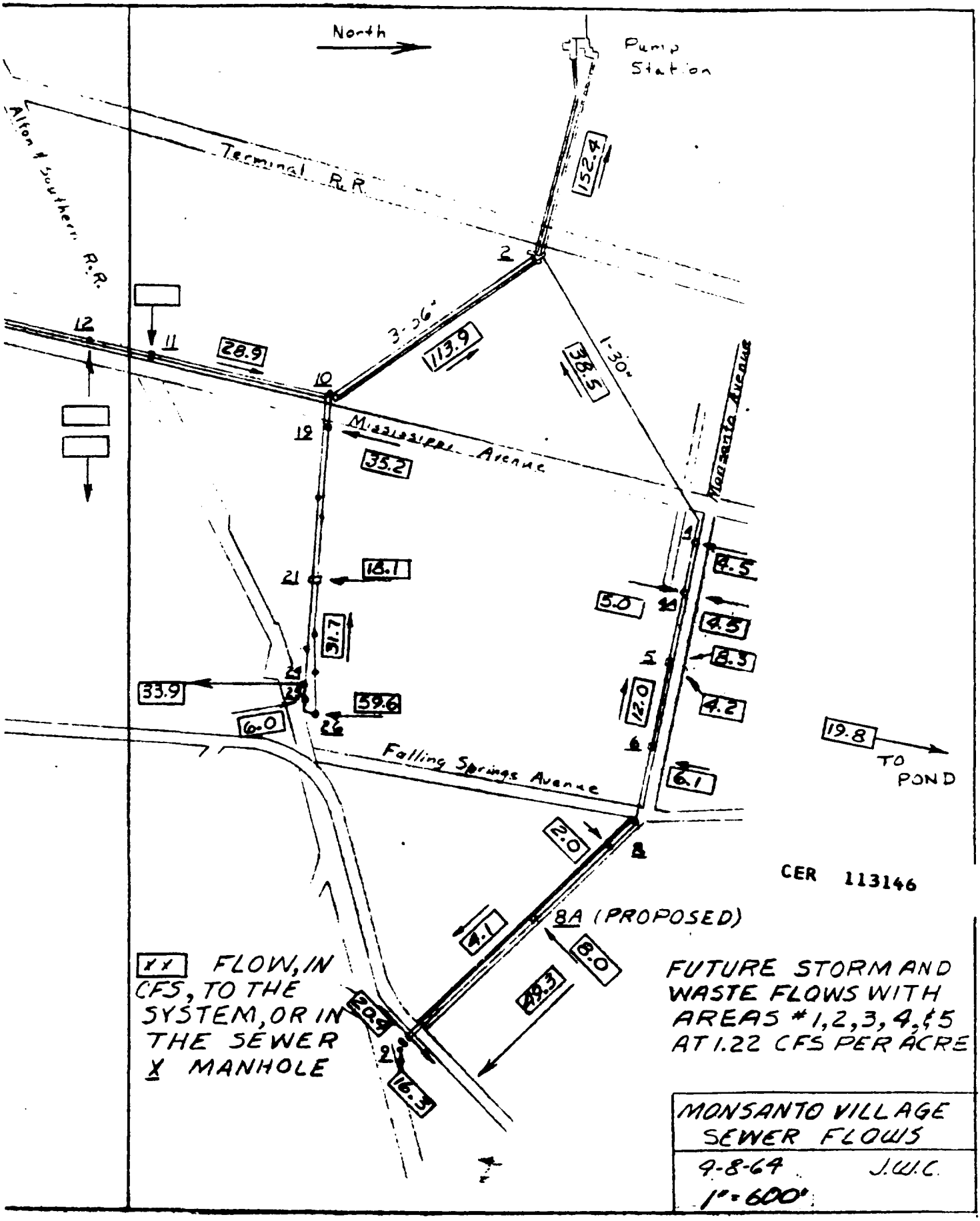
Area # 7

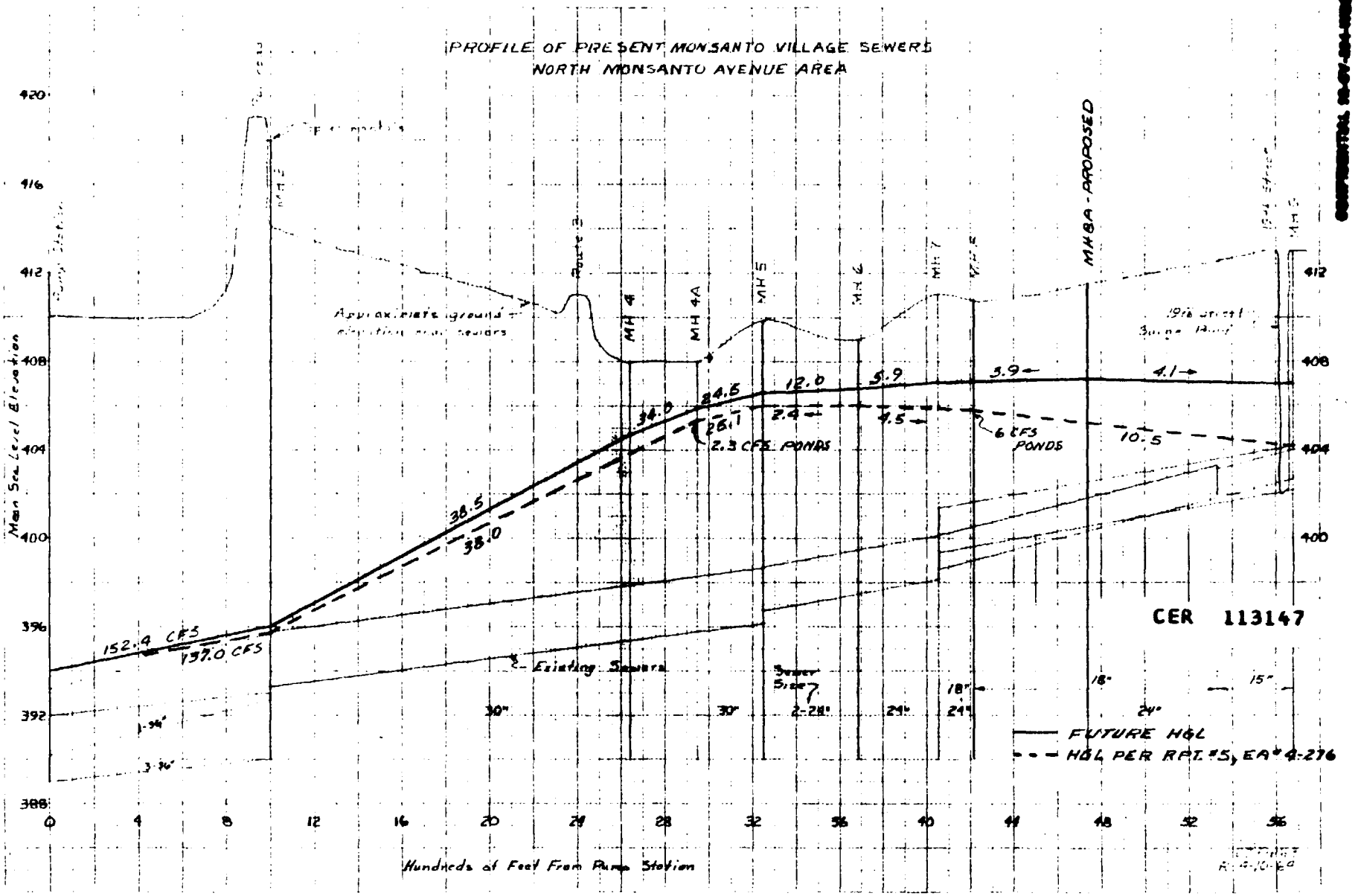
The sewer shown for area # 7, on page 19 , is sized on the basis of carrying waste water only. No HGL is shown, because the sewer will not be surcharged under anticipated waste flows. Any storm water facilities necessary should be drained directly to the river and not connected to the waste sewer system.

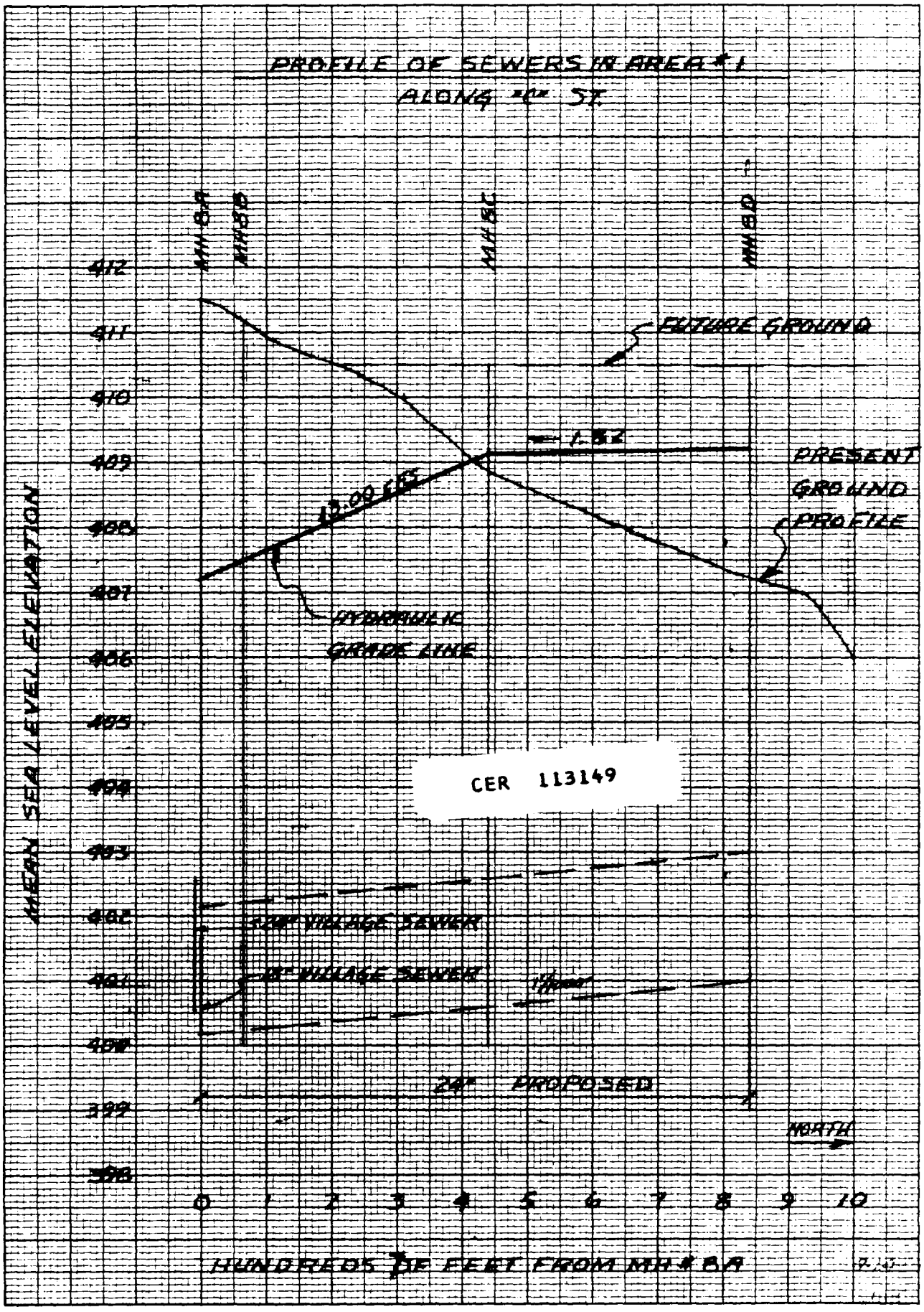
J. W. Caskey

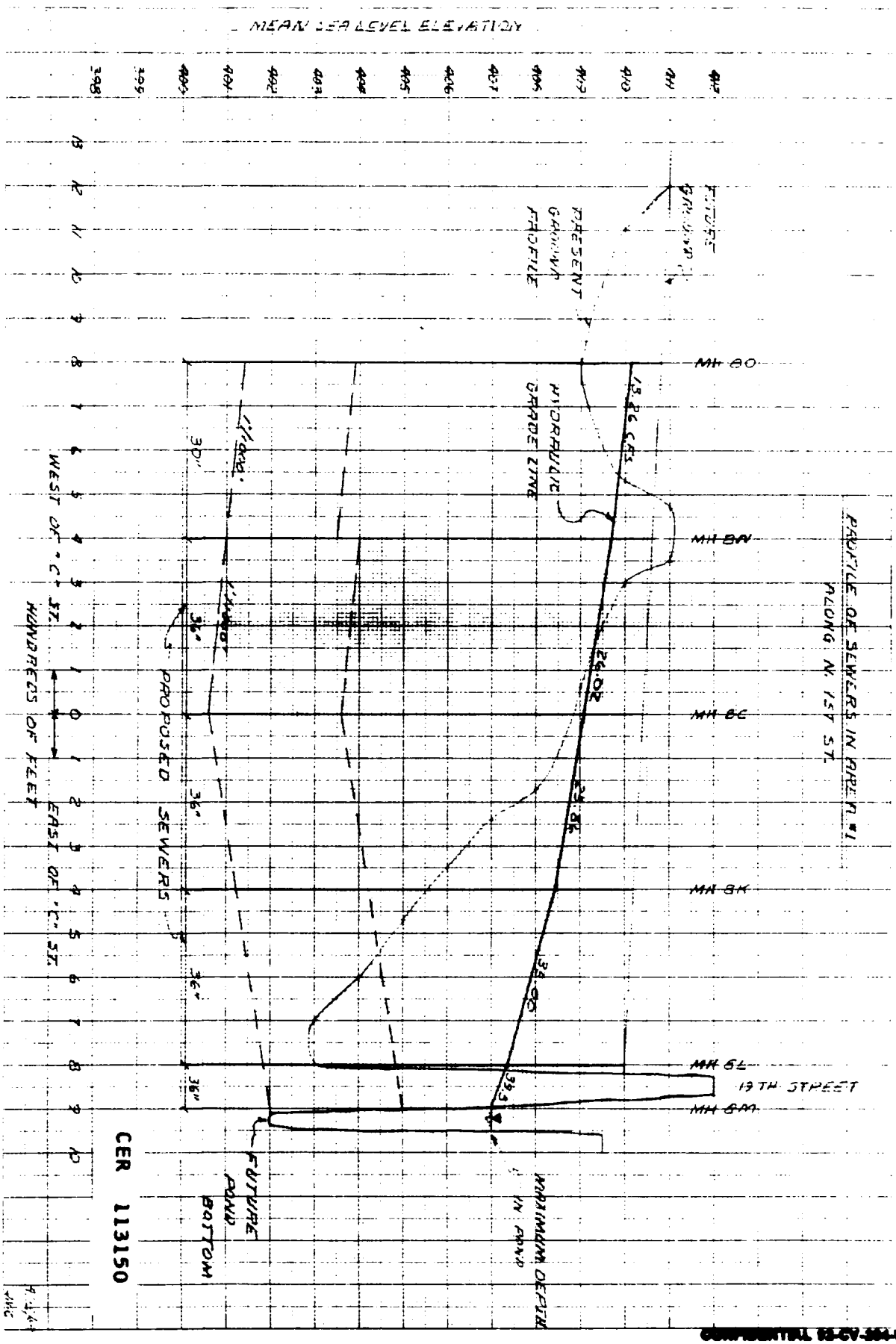
pat
att.

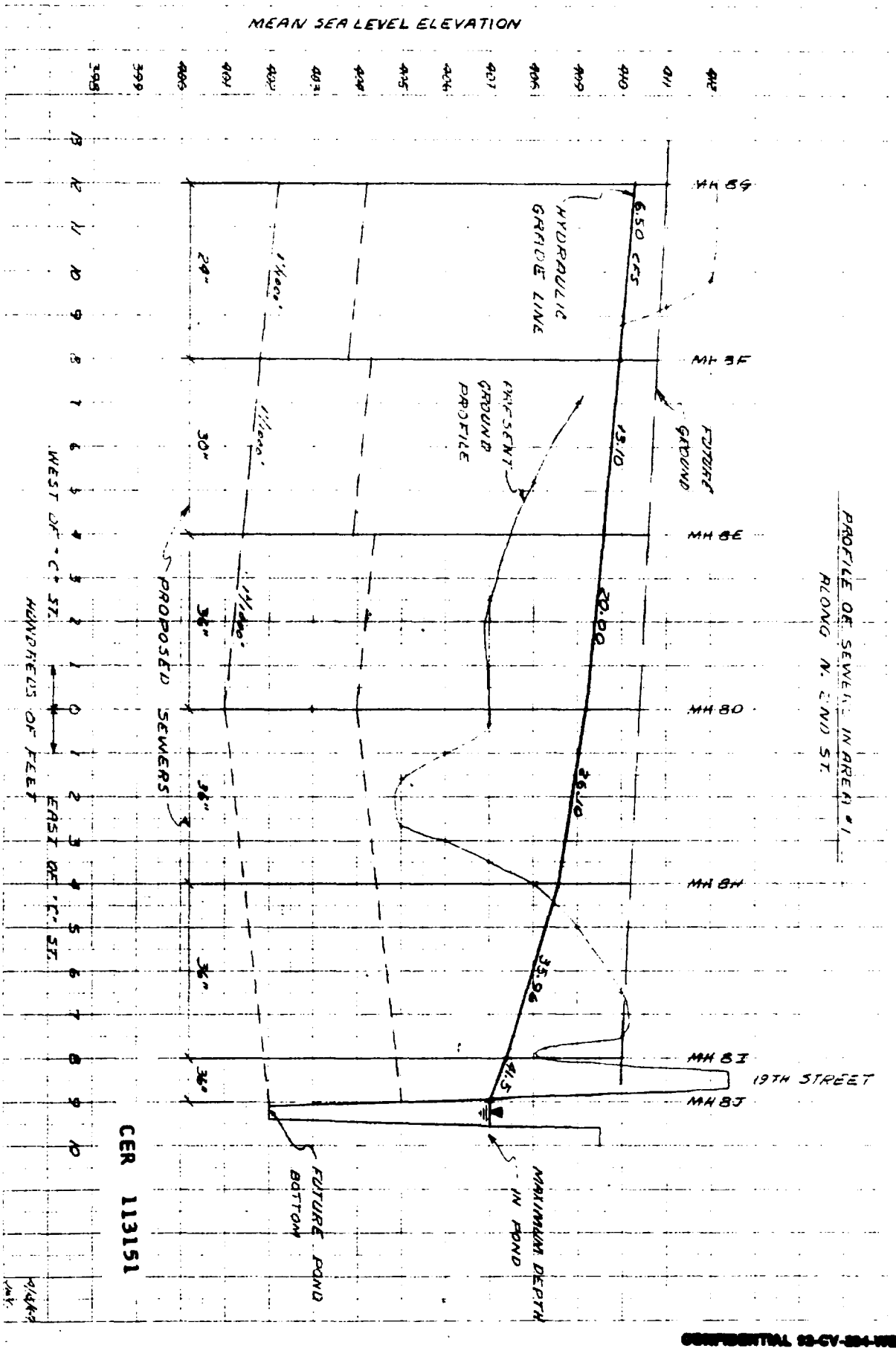


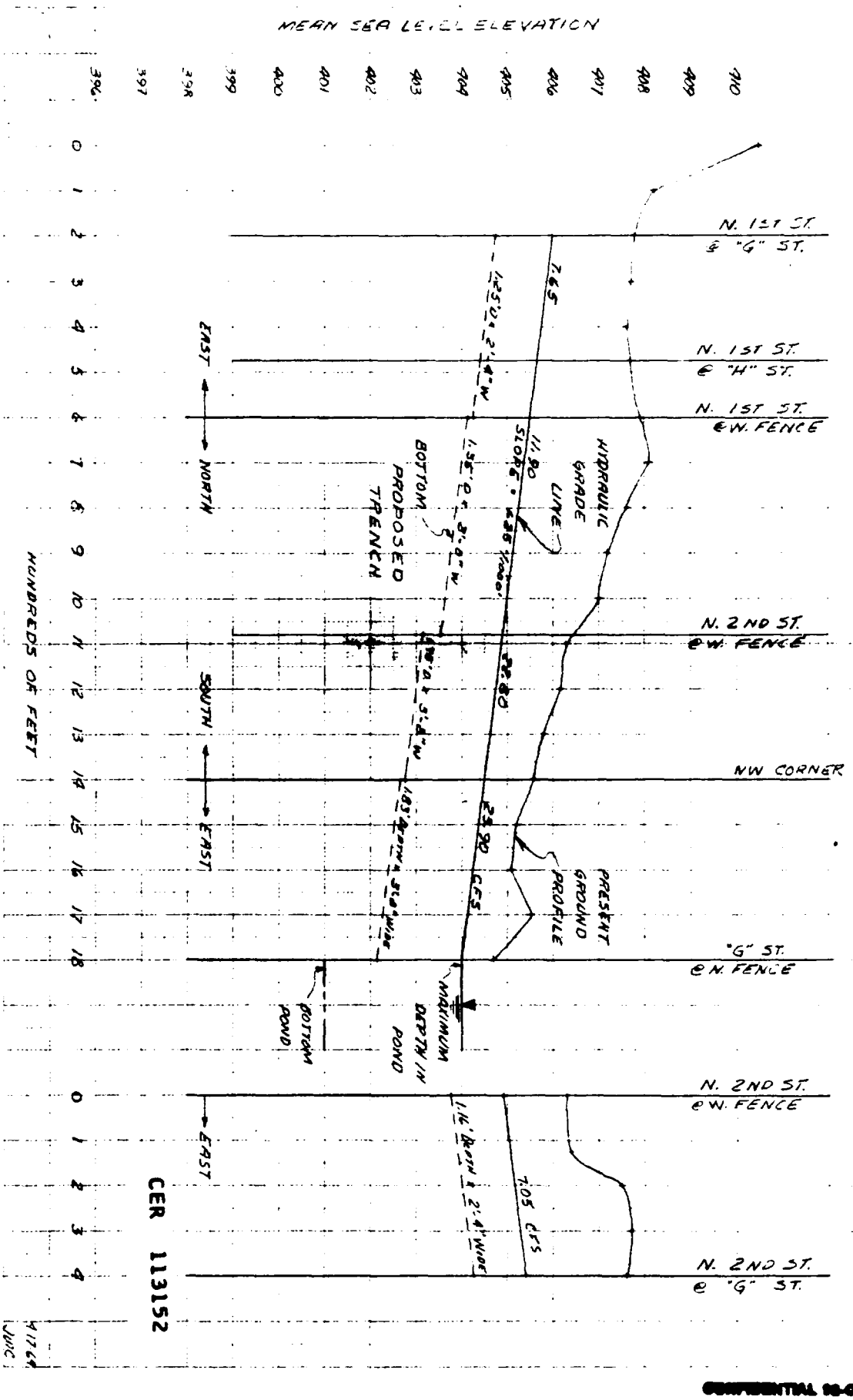

North
Pump Station
Alton & Southern R.R.
Terminal R.R.
Mississippi Avenue
Missouri Avenue
Falling Springs Avenue
TO POND
3'-36"
1'-30"
152.4
113.9
38.5
28.9
35.2
16.1
31.7
33.9
59.6
6.0
5.0
4.5
4.5
8.3
4.2
12.0
19.8
6.1
2.0
4.1
8.0
49.3
20.4
16.3
8A (PROPOSED)
CER 113146
XX FLOW, IN CFS, TO THE SYSTEM, OR IN THE SEWER
X MANHOLE
FUTURE STORM AND WASTE FLOWS WITH AREAS #1, 2, 3, 4, & 5 AT 1.22 CFS PER ACRE
MONSANTO VILLAGE SEWER FLOWS
9-8-64 J.W.C.
1" = 600'



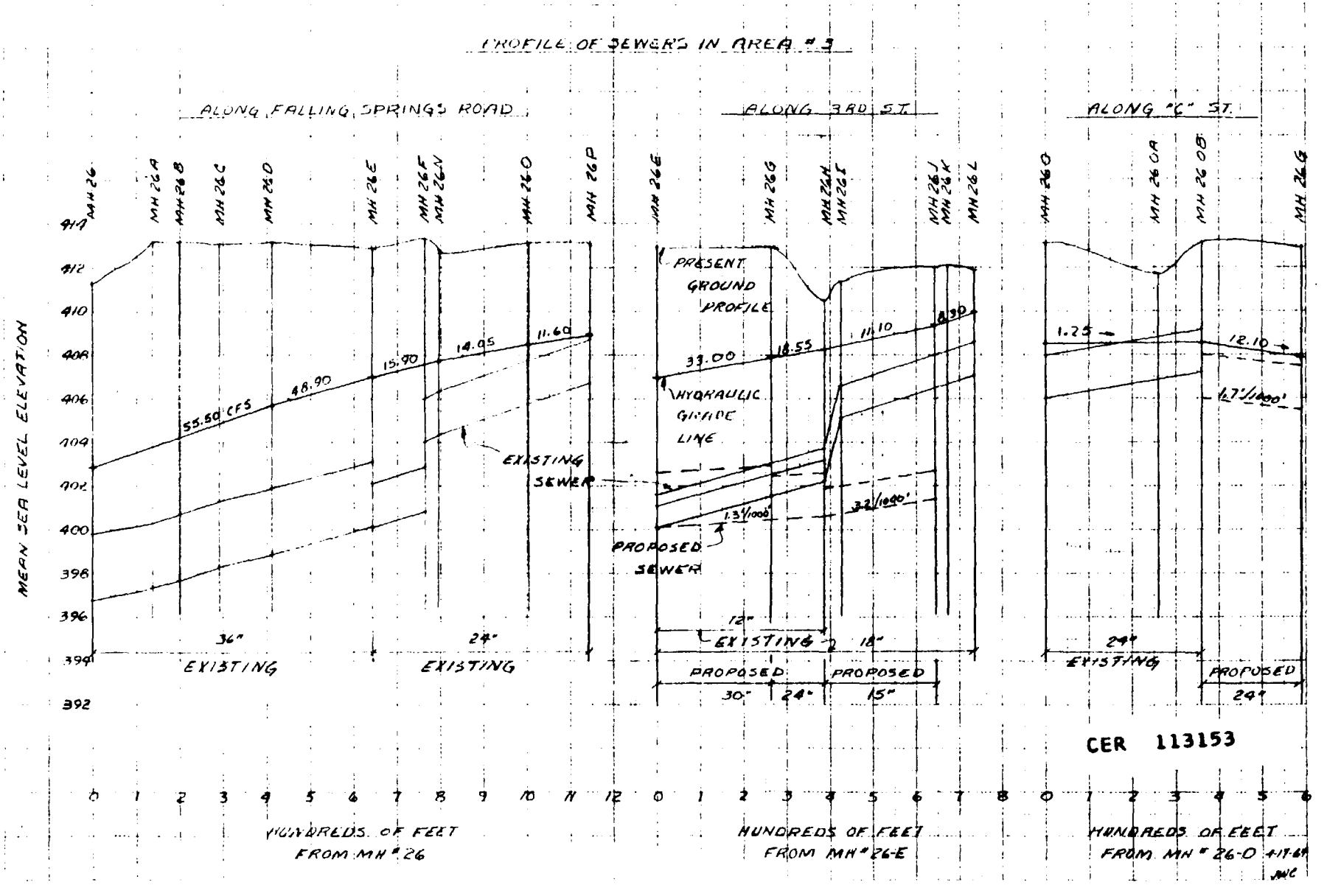








PROFILE OF STORM WATER TRENCHES IN AREA # 2



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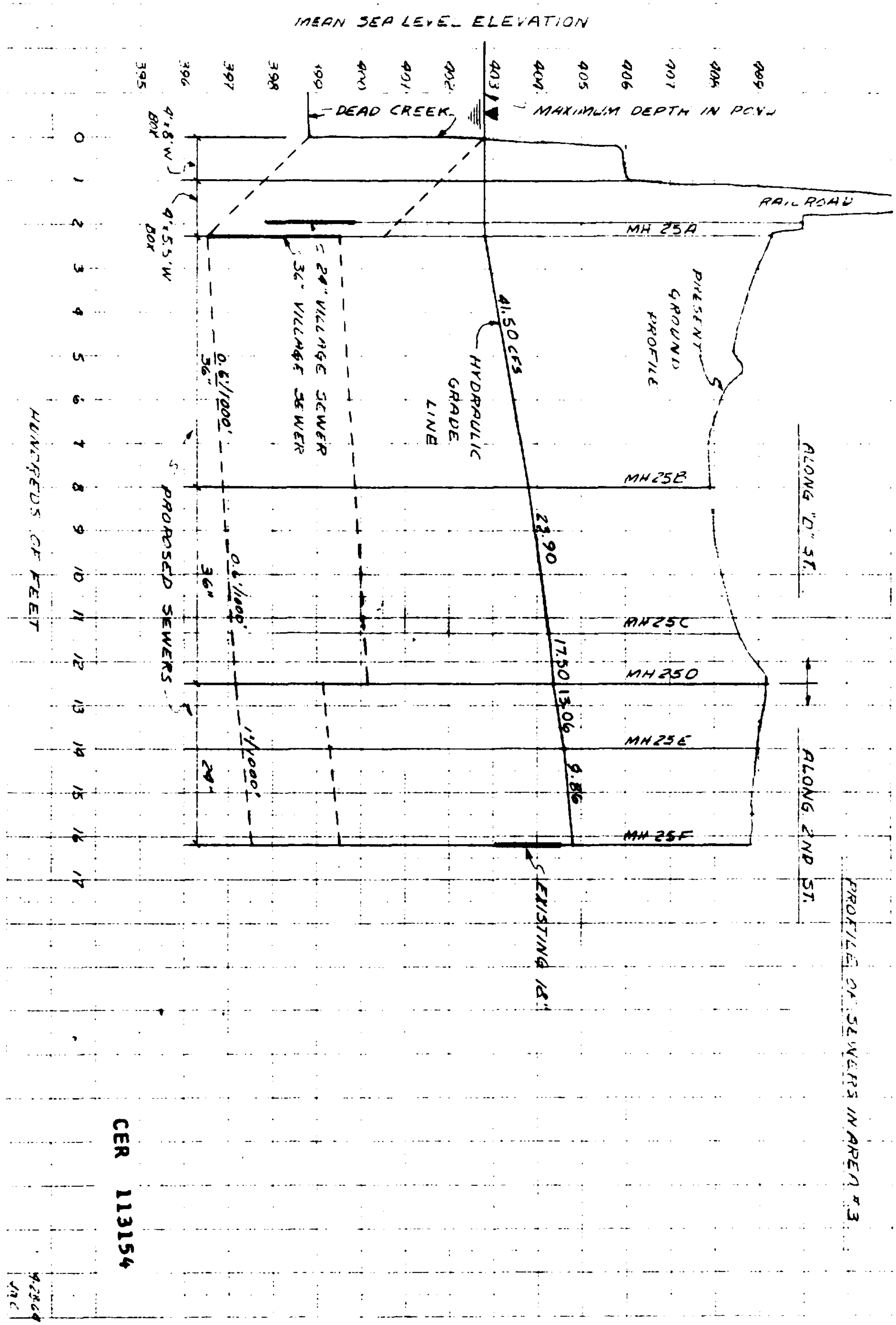

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